

**Remarks**

The application has been reviewed in light of the Official Action mailed April 26, 2005. By the foregoing amendments, claims 1, 4-5, 19, 22-23, and 29 have been amended. Claims 32-33 have been newly introduced, and claims 2-3 and 7 have been cancelled. Claims 1, 4-6, and 8-33 are pending in the application. No new matter is introduced by the amendments. Supports for the amendments can be found throughout the specification, claims, and drawings of the original application.

The Examiner has objected to the information disclosure statement of Applicant (filed 26 April 2004) because of failure to include a concise explanation of the relevance for foreign patent documents that are not in English language. In reply to the Examiner's objection, Applicant files herewith a Supplemental Information Disclosure Statement enclosing English abstracts of the two Korean patent documents (KR 10-382369 and KR 10-382371), of which English abstracts include sufficient information regarding the relevance of the documents. Applicant request the Examiner to reconsider the foreign patent documents in the originally filed Information Disclosure Statement along with their English abstracts filed herewith.

The Examiner has rejected claims 1-31 under 35 U.S.C. 103(a) as being unpatentable over Deroo (U.S. Patent No. 6,089,870) in view of Machida (U.S. Patent No. 6,426,149). Applicant respectfully submits that claims 1, 4-6, 8-31, and new claims 32 and 33 are patentably distinct over the references cited at least for the reasons discussed below.

With regard to claims 1, 4-6, 8-18, and 32 of the invention, as independent claim 1 specifically recites these claims each requires among other limitations: (A) the image layer composed of a colorant ceramic composition is fused with the dental construct substrate at a temperature; (B) that the ceramic layer covering the ceramic image layer

is fused with the image layer at a temperature; and (C) that the difference in the fusing temperature of the ceramic layer is less than 100°F from the fusing temperature of the image layer.

As discussed herein below, Applicant respectfully submits that Deroo (U.S. Patent No. 6,089,870) either alone or in combination with Machida (U.S. Patent No. 6,426,149) fails to disclose or teach each and every element or limitation of claims 1, 4-6, 8-18, and 32 as amended. Therefore, claims 1, 4-6, 8-18, and 32 are patentable over the references cited.

In particular, Deroo fails to disclose or teach at least (B) and (C) of the above-identified limitations of these claims. Deroo discloses a dental construct having a visual element composed of dental stains and affixed on the dental construct. However, Deroo does not disclose or suggest any ceramic layer covering the image layer in which the ceramic cover layer is fused with the image layer at a temperature, as required by the claims of the present application. Thus, Deroo fails to disclose or teach the above-identified limitation (B) of the claims. Moreover, because Deroo does not suggest any ceramic cover layer, it is very clear that Deroo fails to disclose or teach the above-identified limitation (C) of the claims.

Unlike the Deroo disclosure, the present invention as claimed provides a protective ceramic covering layer covering over and fused with the ceramic image layer, which has significant advantages over the prior art device in that it can provide an extended life of the presented image by the durable ceramic cover layer. Moreover, with the ceramic cover layer, any potentially "harmful" or unpleasant contents (even if they are known to be "non-toxic" in general) in the stains of the image layer can be effectively sealed within the covered ceramic layer which is fused with and sealing over the image layer.

Machida discloses a dental construct containing an ornament of metal foil which is coated by a protective layer of a ceramic or glaze material. However, similar to Deroo, Machida also fails to disclose or teach at least (B) and (C) of the above-identified limitations of these claims. Moreover, Machida further fails to disclose or teach the above-identified limitation (A) of the claims.

As shown in FIGS. 1A-1D of the Machida disclosure, having metal foil 2 covered with the ceramic or glaze layer 4, the ceramic layer 4 is not fused with the image layer (i.e., metal foil 2) at a fusing temperature, as required by the above-identified limitation (B) of the claims of the present invention. Because of the difference in the material property of ceramic and metal, the ceramic layer 4 is simply covering or sealing over the metal foil 2 without fusing together. As such, Machida fails to disclose or teach the above-identified limitation (B) of the claims.

Machida further discloses the fusing temperature of the ceramic base 1 (i.e., dental construct substrate) and the ceramic cover layer 4, in which the former is to be at 920°C (i.e., 1688°F) to 960°C (1760°F) and the latter to be at 660°C (1220°F) to 810°C (1490°F), having a difference of 198°F (i.e., 1688°F minus 1490°F) at minimum. This fusing temperature difference is significantly more than 100°F as required by the claims of the present invention. Moreover, this temperature difference disclosed in Machida is the temperature difference between fusing of the ceramic cover layer 4 and that of the dental construct substrate (i.e., the base 1), not that of image layer of ceramic as required by the claims of the present invention. Thus, Machida clearly fails to disclose or teach the above-identified limitation (C) of the claims.

In addition, because the image layer of Machida is formed with metal foil 2, it is very clear that Machida fails to disclose or teach the above-identified limitation (A) of

the claims. In fact, as discussed above, Machida is directed to a substantially different device in which it utilizes a metal foil (such as gold or platinum foil) for an image layer.

Accordingly, in view of the foregoing, Deroo (U.S. Patent No. 6,089,870) either alone or in combination with Machida (U.S. Patent No. 6,426,149) fails to disclose or teach each and every element or limitation of claims 1, 4-6, 8-18, and 32, and these claims are patentably distinct over the references cited.

Applicant respectfully further notes that, because the references fail to disclose or suggest the limitations of the invention as claimed in claims 1, 4-6, 8-18, and 32, any possible motivation cannot be found to combine or modify the teachings of Deroo and Machida in order to reach the subject matter as claimed in the present invention. Therefore, at least for this reason, claims 1, 4-6, 8-18, and 32 are patentably distinct over the references cited.

With regard to claims 19-21 of the invention, as independent claim 19 specifically recites these claims each requires among other limitations: (a) that a (i.e., first) ceramic layer is disposed on the surface of the dental construct substrate; (b) that the image layer composed of a colorant ceramic composition is fused with the first ceramic layer at a temperature; and (c) that another (i.e., second) ceramic layer covering the image layer is fused with the image layer at a temperature.

As discussed herein below, Applicant respectfully submits that Deroo either alone or in combination with Machida fails to disclose or teach each and every element or limitation of claims 19-21 as amended. Accordingly, claims 19-21 are patentable over the references cited.

In particular, Deroo fails to disclose or teach at least (a) and (c) of the above-identified limitations of these claims. As discussed above, Deroo discloses a dental con-

struct having a visual element composed of dental stains and affixed on the dental construct. However, Deroo does not disclose or suggest a first ceramic layer disposed on the dental construct substrate (before applying the image layer). Thus, Deroo fails to disclose or teach the above-identified limitation (a) of these claims. Moreover, Deroo does not disclose or suggest another (i.e., second) ceramic layer covering the image layer of the dental construct (after applying the image layer), which is fused with the image layer disposed on the first ceramic layer. Thus, Deroo fails to disclose or teach the above-identified limitation (c) of these claims. Unlike the Deroo disclosure, the present as claimed provides the image layer of ceramic colorant which is integrally and firmly fused with the first ceramic layer and the second covering ceramic layer, and the life of the image presented in the dental construct can significantly be extended.

Similar to Deroo, Machida also fails to disclose or teach at least (a) and (c) of the above-identified limitations of these claims. As discussed above, Machida discloses a dental construct containing an ornament of metal foil which is coated by a protective layer of a ceramic or glaze material. However, Machida does not disclose or suggest a first ceramic layer disposed on the dental construct substrate (before applying the image layer). Thus, Machida fails to disclose or teach the above-identified limitation (a) of these claims. Moreover, Machida does not disclose or suggest another (i.e., second) ceramic layer covering the image layer of the dental construct (after applying the image layer), which is fused with the image layer disposed on the first ceramic layer. Thus, like Deroo, Machida also fails to disclose or teach the above-identified limitation (c) of these claims.

In fact, as discussed above, Machida is directed to a substantially different device in which it utilizes a metal foil (such as gold or platinum foil) for an image layer, thus further failing to disclose or teach the above-identified limitation (b) of the claims.

Accordingly, in view of the foregoing, claims 19-21 are patentably distinct over the references cited. Moreover, because the references fail to disclose or suggest the limitations of the invention as claimed in claims 19-21, any possible motivation cannot be found to combine or modify the teachings of Deroo and Machida in order to reach the subject matter as claimed in the present invention.

Now with regard to claims 22 and new claim 33 of the present invention, these claims each requires as independent claim 22 recites among other limitations: (I) that at least one overcoat layer is disposed on the rear surface of the dental construct substrate; (II) that the image or information media (which is composed of a ceramic colorant composition and disposed on the rear surface of the dental construct) contains characters, codes or numbers usable for identification of a person or animal bearing the dental construct; and (III) that the image or information media is noticeable from the rear surface of the dental construct without changing the appearance thereof from the front surface of the dental construct.

Deroo fails to disclose or teach among others at least (I), (II) and (III) of the above-identified limitations of these claims. Deroo discloses a dental construct having a visual element composed of dental stains and affixed on the dental construct. However, Deroo does not disclose or suggest that the visual element appears on the rear surface of the dental construct. Thus, Deroo fails to disclose or teach the above-identified limitation (I) of these claims. Moreover, Deroo does not disclose or suggest that the visual element contains characters, codes and/or numbers usable for identification of a person or animal bearing the dental construct. Thus, Deroo fails to disclose or teach the above-identified limitation (II) of these claims. Furthermore, Deroo does not disclose or suggest that the visual element is noticeable from the rear surface of the dental construct without changing the appearance thereof from the front surface of the dental

construct. Thus, Deroo fails to disclose or teach the above-identified limitation (III) of these claims.

Similar to Deroo, Machida also fails to disclose or teach among others at least (I), (II) and (III) of the above-identified limitations of these claims. As discussed above, Machida discloses a dental construct containing an ornament of metal foil which is coated by a protective layer of a ceramic or glaze material. However, Machida does not disclose or suggest that the ornamental (of metal foil) appears on the rear surface of the dental construct. In fact, there is no recognizable reason in the Machida device to place such ornament on the rear surface of the dental construct. Thus, Machida fails to disclose or teach the above-identified limitation (I) of these claims. Moreover, Machida does not disclose or suggest that the ornament (of metal foil) contains characters, codes and/or numbers usable for identification of a person or animal bearing the dental construct. Thus, Machida fails to disclose or teach the above-identified limitation (II) of these claims. Furthermore, Machida does not disclose or suggest that the ornament is noticeable from the rear surface of the dental construct without changing the appearance thereof from the front surface of the dental construct. Thus, Machida fails to disclose or teach the above-identified limitation (III) of these claims.

Unlike the cited references, the present invention as claimed provides an image or information media of ceramic colorant, which is particularly disposed on the rear surface (i.e., the lingual surface) of the dental construct, contains characters, codes and/or numbers usable for identification of a person or animal bearing the dental construct, and is noticeable from the rear surface of the dental construct without changing the appearance thereof from the front surface of the dental construct. As described at, for example, paragraph [00031] of the present application, these claimed features of the invention provide particular advantages or merits to the society for keeping social or important personal records safely and permanently. Having such a permanent identifi-

cation composed of ceramic colorant and kept in the rear surface of the teeth without changing the appearance thereof from the front surface of the teeth, the claimed invention enables keeping social or personal records in the teeth permanently, which is hardly erased or burnt out even after subjecting to a fire accident or terrorist's attacks, for instance. These features and limitations of the invention are neither disclosed nor recognized by the prior art references.

Accordingly, in view of the foregoing, claims 22 and 33 are patentably distinct over the references cited. Moreover, because the cited references fail to disclose or suggest the limitations of the invention as claimed in claims 22 and 33, any possible motivation cannot be found to combine or modify the teachings of Deroo and Machida in order to reach the subject matter as claimed in the present invention.

Finally with regard to claims 23-31 of the invention, these claims each requires as independent claim 23 recites among other method steps: (i) firing the dental construct substrate with the decal sheet attached thereon within a vacuum furnace such that the image or information media on the decal sheet is firmly fused on the surface of the dental construct substrate; (ii) applying a ceramic glaze material over the fired dental construct substrate; and (iii) firing the glaze-applied dental construct substrate, in which the firing temperature of the glaze-applied dental construct is within a range of difference less than 100°F from the firing temperature of decal-attached dental construct.

Deroo fails to disclose or teach among others at least (i), (ii) and (iii) of the above-identified limitations of these claims. In particular, Deroo does not disclose or suggest that the dental construct having a decal attached thereon is subject to firing *within a vacuum furnace* as required by the claims of the present invention. Thus, Deroo fails to disclose or teach the above-identified limitation (i) of these claims. More-

over, Deroo does not disclose or suggest that the fired dental construct is subject to applying a ceramic glaze material thereon. Thus, Deroo fails to disclose or teach the above-identified limitation (ii) of these claims. Furthermore, Deroo does not disclose or suggest that the fired and glaze-applied dental construct is subject to another firing step, in which the firing temperature of the glaze-applied dental construct is within a range of difference less than 100°F from the firing temperature of decal-attached dental construct. Thus, Deroo fails to disclose or teach the above-identified limitation (iii) of these claims.

Similar to Deroo, Machida also fails to disclose or teach among others at least (i) and (iii) of the above-identified limitations of these claims. As discussed above, Machida discloses a dental construct containing an ornament of metal foil which is coated by a protective layer of a ceramic or glaze material. However, Machida does not disclose or suggest that the dental construct having a metal ornament therein is subject to firing *within a vacuum furnace* as required by the claims of the present invention. Thus, Machida fails to disclose or teach the above-identified limitation (i) of these claims. Moreover, Machida does not disclose or suggest that the fired and glaze-applied dental construct is subject to another firing step, in which the firing temperature of the glaze-applied dental construct is *within a range of difference less than 100°F* from the firing temperature of decal-attached dental construct. Thus, Machida fails to disclose or teach the above-identified limitation (iii) of these claims. These claimed features of the invention have particular importance as described in the specification as originally filed and also discussed herein above.

Accordingly, in view of the foregoing, claims 23-31 are patentably distinct over the references cited. Moreover, because the cited references fail to disclose or suggest the limitations of the invention as claimed in claims 23-31, any possible motivation can-

not be found to combine or modify the teachings of Deroo and Machida in order to reach the subject matter as claimed in the present invention.

Accordingly, in view of the foregoing amendments and remarks, it is respectfully submitted that all of the claims currently pending in the application (i.e., claims 1, 4-6, and 8-33) are now in condition for allowance. Reconsideration and early notice to that effect is earnestly requested.

Respectfully submitted,

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